



LAWRENCE  
LIVERMORE  
NATIONAL  
LABORATORY

# Lessons Learned Class

K. Barat

February 25, 2005

International Laser Safety Conference  
Marina Del Rey, CA, United States  
March 5, 2005 through March 10, 2005

## **Disclaimer**

---

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the University of California nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the University of California, and shall not be used for advertising or product endorsement purposes.

**Lessons Learned Class**  
**Paper 502**  
**Ken Barat, CLSO**  
**National Ignition Facility (NIF), Lawrence Livermore National Laboratory**  
**Livermore, California, United States**

Basic laser safety training at Lawrence Livermore National Laboratory is provided through a multiple module web-based course. The web-based course presents a wide and detailed review of laser safety topics including: biological effects, laser protective eyewear, fiber optic laser use, control measures, and more. It opens with a re-enactment of a laser accident. While supportive of this web-based course and actively involved in its development, the NIF Directorate has developed a classroom presentation adjunct to the course for laser users working in NIF. This author considers the LLNL web-based laser safety course to be one of, if not the best, such course available. Still, experience has shown that a “lessons learned program” is a great re-enforcer of laser safety. What-is-more, the laser lessons learned class provides important “face-to-face” interactions and discussion.

The object of the “laser lessons learned course” is not to repeat the web course but present laser related lessons learned to the staff. In this author’s opinion, lessons learned is the strongest safety re-enforcement one can present to the laser user community. For example, it can show how a practice that might be common to laser users can lead to a dramatic injury and a programmatic long-term work stoppage.

The course outline is as follows:

- A video of a laser application with minimum safety practices,
- Who is typically involved in laser incidents,
- Commonly given reasons for violating laser safety procedures,
- A review of perceived hazard incidents (i.e flashlamp light mistaken for laser scatter)
- A review of several laser accidents,
- What to do if an injury is suspected and what we can do about injuries,
- Discussion of whether laser accidents can be eliminated (and of course they can be eliminated), and
- Summation

To date, the class has received positive feedback from experienced and inexperienced laser users. This, along with the broader lessons learned program within the NIF Directorate, works to keep laser users focused on compliance with laser safety protocols.

The class draws out comments from laser users on the times and reasons why laser safety practices were not followed. Major laser accidents that relate to a research setting are discussed, along with who is typically involved in accidents. The examples used state where the incidents happen and the specification of the lasers. All this is to clearly relate to NIF laser users the common elements between their laser use and those involved in the accidents.

The examples presented in the class show how peers of our laser users have been involved in laser incidents and explain the variations from laser safety practice and the consequences, including the consequences to individuals and programs. Most importantly, the class emphasizes how compliance with our existing laser safety protocols would have prevented the incidents.

In conclusion, while basic and refresher laser safety training are important, it is learning how others have been injured that results in the lasting impression. As our laser use changes, the class is flexible to use lessons learned from these new applications and directions. A class dedicated to laser lessons learned is an important element of laser safety.